

## Mothers' Awareness about Poisoning Prevention among their Children under Five Years Old

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### Abstract

**Background:** Most childhood poisoning cases occur in the home as children less than five years old spend most of their time there. These cases are presumed to be preventable or have fewer complications through the removal of hazards or applying the basics of first aid measures by their mothers or caregivers. **The Research design:** a descriptive exploratory study was utilized. **The study aimed** to assess mothers' awareness about poisoning prevention among their children under 5 years. **Setting:** The study was conducted in the Maternal and Child Health Center of Toukh Dalaka village in Tala City at the Menoufia governorate. **The sampling technique** was purposive nonprobability sampling. 336 mothers were included in the study which started on January, 2021 and ended on April, 2021. **The tool of data collection** was an interview questionnaire sheet, which consists of 4 parts. **1<sup>st</sup> part:** Socio-demographic characteristics of the studied mothers and children. **2<sup>nd</sup> part:** mothers' knowledge about the poisoning of children under 5 years. **3<sup>rd</sup> part:** mothers' reported practices toward home environmental safety and poisoning preventive measures should be used for their children under 5 years. **4<sup>th</sup> part:** mothers' reported practices toward poisoning first aid for their children under 5 years. **The results** of this study illustrate that less than half of the studied mothers were between 25 and 33 years, the majority of them had at least middle education, about half of them were employees, the majority were married, more than half of them lived in extended families, about third of them had two children and more than third of them had a fair family income monthly. About fifth of the studied children were previously exposed to poisoning, as household, pesticides, medication and other causes. Less than two-thirds of the studied mothers had total complete correct answers about poisoning. More than two-thirds of the studied mothers did satisfactory total reported practices toward home environmental safety, poisoning prevention and poisoning first aid for their children under 5 years. **The current study concluded that** there is a statistically significant relation between mothers' age, educational level, occupation, family income monthly and their knowledge about poisoning. A positive correlation with a highly statistically significant relation was found between mothers' total knowledge about poisoning with their reported preventive and first-aid practices. A statistically significant relation between mothers' age, educational level, occupation, marital status, family income monthly and their reported practices toward poisoning first aid for their children under five years. **This study recommended** continuous, repetitive health education programmes and training courses for mothers who have children under-five years and attend primary health care settings regarding poisoning prevention, environmental safety measures and first-aid practices.

**Keywords:** Awareness, children under five years, Poisoning, prevention.

### Introduction

Poisoning according to WHO refers to 'an injury sustained due to exposure to a substance that causes cellular injury or death'. Exposure to such substances can be by ingestion, inhalation, injection or absorption (Peden et al., 2019).

Poisoning may occur intentionally or unintentionally but the majority of poisoning

cases occur in children and most of these are unintentional. Acute childhood poisoning aged 0–5 years old is a major health problem worldwide and is deemed one of the leading causes of unintended deaths. Also, it is still a serious issue in developing countries where it represents a common cause of emergency department presentation and admission (Heron, 2017).

According to WHO poisoning is one of the top five causes of death from unintentional injuries in children and mortality due to acute unintentional poisoning among children under 4 years of age varies from 0.3 to 7 per 100,000 people in different countries of the world. In low-income and middle-income countries, only 2% of poisonings occurred in children under 1 year of age, compared with 54% in the 1–4-year age group (WHO, 2015).

Pesticides, household chemicals, medication, Carbon monoxide, poisonous plants, bites and stings are common causes of childhood poisoning. Patterns of prevalence and risk factors change over time and in cases of acute poisoning of children, there are differences from one country to another and some variability is evident even between geographic areas within a country and according to the cultural and economic characteristics of different communities (Majsak et al., 2014).

Severe poisoning could have substantial and irreparable effects such as psychological-emotional; it can also lead to death. Treatment for cases of poisoning could be costly for families as well as healthcare systems. Disability caused by poisoning not only affects a child's health but also his or her education and the life of other members of the family. Many costs are imposed on the healthcare system from cases of accidental poisoning (Ahmadabadi et al., 2016).

The quality or state of mothers' awareness is the knowledge and understanding that something is happening or exists and mothers' awareness about poisoning prevention is the knowledge and understanding of poisoning and its preventive measures and also their practices applicability toward prevention of poisoning for their children under 5 years (Merriam, 2022).

The home and its surroundings could be dangerous places for children, particularly for the possibility of unintentional poisoning. Children are naturally curious, exploring in and around the home. Thousands of children are admitted to emergency departments because they have inadvertently consumed some type of household product, medicine or pesticide. Most

of these "accidental" poisonings could have been prevented by increasing mothers' awareness about poisoning prevention and correct first aid practices in case of poisoning to prevent its complications (Grandjean, 2016).

Mothers take fewer precautions against childhood poisonings if these precautions involve more effort, especially if they involve changes in their behaviour and if community health nurses provide health education programmes and increase mothers' awareness about poisoning prevention, safety measures and first aid, prevention is likely to be more successful and more precautions will be promoted (Kendrick, 2019).

### **Significance of the study**

In Egypt, acute poisoning represents a significant proportion of emergency visits of children and young people. This labours a burden on healthcare, society and the economy and thus, it drains resources and multiplies the workload (Alazab et al., 2013).

Poisoning is considered the fourth leading cause of death in Egypt after road traffic accidents, burns and drowning. Despite the difficulty to estimate the number of poisoning cases in Egypt due to lack of reliable data, chemicals and drug poisoning are the higher causes among children (Hassan et al., 2014).

Lack of mothers' awareness is an identified risk factor for unintentional pediatric poisoning thus, the level and gaps of awareness among mothers should be determined and could be useful in developing prevention strategies.

### **Aim of the study**

The study aimed to assess mothers' awareness about poisoning prevention among their children under 5 years old through:

- Assessing mothers' knowledge regarding poisoning and its prevention for their children.
- Assessing mothers' reported practices toward home safety measures and poisoning prevention for their children.
- Assessing mothers' reported practices toward poisoning first aid.

### Research Question

- 1) Is there a relation between mothers' socio-demographic data and their knowledge about poisoning prevention for their children under 5 years old?
- 2) Is there a relation between mothers' knowledge and their reported practices toward home environmental safety and poisoning prevention for their children under 5 years old?
- 3) Is there a relation between mothers' socio-demographic characteristics and their poisoning first aid measures of their children under 5 years old?

### Subject and Methods

#### Technical design:

##### A: Research design

A descriptive, exploratory study design was used.

##### B: Setting

The study was conducted at the Maternal and Child Health Center of Toukh Dalaka a village in Tala City at the Menoufia governorate.

##### C: Subject:

The study's subjects included mothers' and their children under five years old. The number of children under five years old in 2018 was (N = 2655) at the Toukh Dalaka Maternal and Child Health centre.

##### D: Sampling

##### Sampling type:

The purposive nonprobability sampling technique was taken from mothers, who visited Toukh Dalaka Maternal and Child Health Centre.

##### Sample size:

Based on the sample size equation 336 mothers participated in this study.

So, the sample size was calculated by adjusting the power of the test to 80% and the confidence interval to 95% with the margin of error accepted adjusted to 5% using the following equation:

Type I error ( $\alpha$ ) = 0.05

Type II error (B) = 0.2

With power of test 80%

Sample size calculation equation

$$n = \frac{N \times p(1-p)}{\left[ \frac{N-1}{d^2} \times (d^2 \div z^2) \right] + p(1-p)}$$

$N \times p(1-p)$	$= (2655 \times (0.5 \times (1-0.5))) /$
$N-1$	$= (2655-1) \times$
$d^2/z^2$	$= 0.0025 / 3.8416 +$
$p(1-p)$	$= 0.5 \times (1-0.5)$
$N$	$= 336$

N= Community size

z= Class standard corresponding to the level of significance equal to 0.95 and 1.96

d= The error rate is equal to 0.05

p= Ratio provides a neutral property = 0.50 (Chow et al., 2017).

##### Inclusion criteria:

Any mother who has a child under five years old was included in the sample.

##### Tool for data collection

Pre-designed Questionnaire Format by Interviewing: It was designed by the investigator based on updated related literature to assess mothers' awareness regarding poisoning prevention for their children under 5 years old. It consisted of four parts:

**Part 1:** Socio-demographic characteristics of the studied subject which include:

**A.** Socio-demographic characteristics of the studied mothers such as age, level of education and occupation, marital status, family type, family income, and the number of children in the family (Questions from 1-8).

**B.** Socio-demographic characteristics of the studied children such as; age, gender, child's ranking among his siblings and history of previous exposure to poisoning (Questions from 9-20).

**Part 2:** Mothers' knowledge about the poisoning of children under 5 years old which was modified from the literature review and Peden et al., 2019 world report of child injury prevention 2012 from WHO. It involved: mothers' source of knowledge about poisoning, meaning, route, types, causes, symptoms, diagnosis, management, first aid and

the preventive measures of poisoning (Questions from 21-38).

❖ **Scoring system:**

The score for the knowledge questionnaire was 51 marks for 17 questions (equal to 100%). The studied mothers' answers were checked using a model key answer and each answer took a mark as 2 for the complete correct answer, 1 for the correct incomplete answer and 0 for the incorrect answer and the total score of 34 or more was a correct complete answer, 17 to 34 was a correct incomplete answer and less than 17 was incorrect answers.

Accordingly, their total knowledge was categorized into; correct knowledge (scored 50%, 25 marks or more), and incorrect knowledge (scored less than 50% or less than 25 marks).

**Part 3:** Mothers' reported practices toward home environmental safety and prevention of poisoning for their children under 5 years old. **It was modified from Melanie, 2020 and RoSPA, 2020** which included chemical, gas and food poisoning prevention (Questions from 39-65).

❖ **Scoring system:**

The score for the mothers' reported practices toward home environmental safety and prevention of poisoning for their children under 5 years old checklist was 27 marks for 27 questions (equal to 100%). The studied mothers' answers were checked using a model key answer and each answer took a mark as 1 for done practice and 0 for not done.

The total scoring system of their reported practices 100% were categorized into satisfactory (scored 50% or more, 14 marks or

Alpha Cronbach Reliability Analysis of the Used Tool

Items	No. of variables	Alpha Cronbach
Total knowledge	17	0.795
Practices toward	27	0.804

**N.B:** The reliability was scaled as follows: <0-0.25 weak reliability, 0.25-0.75 moderate reliability, 0.75-<1strong reliability and 1 is

more), and unsatisfactory (scored less than 50% or less than 14 marks).

**Part 4:** mothers' reported practices toward poisoning first aid for their children under 5 years old. **It was modified from American national red cross 2020, Government of Western Australia, department of health, 2020 and Mayo clinic** which included first aids of poisoning by ingestion of a toxin, chemical poisoning, poisoning by swallowing small batteries, gas poisoning, skin poisoning, eye poisoning, bites and stings poisoning and what to do if the child went to the hospital (Questions from 66-90).

❖ **Scoring system:**

The score for the mothers' reported practices toward poisoning first aid for their children under 5 years old checklist was 25 marks for 25 questions (equal to 100%). The studied mothers' answers were checked using a model key answer and each answer took a mark as 1 for done practice and 0 for not done.

The total scoring system of their reported practices 100% were categorized into satisfactory (scored 50% or more, 13 marks or more), and unsatisfactory (scored less than 50% or less than 13 marks).

**Validity:**

The revision of tools was done by three experts in community health nursing to measure the content and face validity of tools to determine the appropriateness of each item to be included in the questionnaire sheet. Correction, rearrangement, rephrasing of some items and modifications were done.

**Reliability:**

Reliability was tested by alpha chrombakh test and no modifications were done.

home environmental safety and prevention of poisoning for their children under 5 years		
Practices toward poisoning first aid for their children under 5 years	25	0.835
Total Practices	52	0.820

optimum. The reliability of this questionnaire was 0.81.

### **Operational design Preparatory phase**

It included reviewing related literature and theoretical knowledge of various aspects of the study related to awareness regarding poisoning prevention for children under 5 years old using, previous studies, books, articles, the internet, periodicals and magazines to develop the tool for data collection.

### **Ethical consideration**

Approval was obtained from the scientific research ethical committee in the faculty of Nursing Ain Shams University before starting the study.

The aim of the study was explained to each mother included in the study before applying the tools to gain their confidence and trust. The investigator assured maintaining anonymity and confidentiality of the subject data.

Oral consent was obtained from each mother to participate in the study. Each mother was told that she can withdraw from the study participation when she wanted. Data was collected and treated confidentially.

### **Administrative design**

Permission for conducting the study was assured by the administrative authority of the faculty of Nursing Ain Shams University and the administrative authority of the Maternal and child health centre at Toukh Dalaka Village.

### **Pilot study**

It was carried out on 10% of mothers from the sample (34 mothers) of the total participants to ensure clarity and determine the time required to complete the different data collection tool and test the applicability of the tool. No modifications were needed and the pilot sample was included in the actual study sample.

### **Filed wok**

The investigator revised the literature to design the tools and then it was revised from expertise to test content validity.

Approval was obtained from the concerned authorities in the Faculty of Nursing Ain Shams University on 29 November 2020 directed to the concerned authorities of public health of Menofia governorate which was approved on 22 December 2020 and directed to the maternal and child health centre in Toukh Dalaka Village which approved at 12 January 2021.

The investigator met the mothers one day per week to fill the questionnaire from 9 am to 1 pm on Tuesday every week for 3 successive months starting on Tuesday 19 January 2021 and ending on 20 April 2021.

Mothers were interviewed individually or in groups that entail 3-5 mothers according to their readiness and the questionnaire format was filled in by the educated mothers and by the investigator for illiterate mothers.

The questionnaire took about 12-15 minutes for mothers who filled it individually and also 20 minutes or less for the investigator during filing it for illiterate mothers with a total of approximately 24 questionnaires were filed per day.

### **Statistical design**

The collected data were organized, categorized, tabulated and statically analyzed using the statistical package for social science (SPSS) version 20 to assess mothers' awareness about poisoning prevention among their children under five years. Data were presented in tables and graphs. The statistical analysis includes percentage (%), mean  $\pm$  SD, chi-square and Pearson correlation (R).

The observed differences and associations were considered as follows:

P.> 0.05 Non-significant relation

P.  $\leq$  0.05 significant relation

P.  $\leq$  0.001 highly significant relation

**Study limitations:** No limitation was found.

**Results:**

**Table (1):** reveals that 40.2% of the studied mothers were between 25 and 33 years old, while 47.3% were university graduates and 49.4% of them were employees.

Additionally, 94.3% of them were married, 61.3 of them lived in extended families, 33.6 had 2 children and 40.2% of them had from 2000 to 3000 LE as a family income monthly.

Also, 61% of the studied children were from 3 to 5 years, 54.2% were males and 30.6% of them were the second son.

**Table (2):** shows that 19.6% of the studied children were previously exposed to poisoning 30.3% of them had household and pesticide poisoning and 19.7% had medication poisoning, 45.5% were poisoned at noon and 22.7% were poisoned in the living room. Also, 62.1% of them had interventions before transferring to the hospital and 68.3% had first aid from their mother.

**Table (3):** reveals a statistically significant relation between mothers' age, educational level, occupation, family income

monthly and their knowledge about poisoning, however, there were no statistically significant relation between mothers' marital status, family type or the number of children and their knowledge about poisoning.

**Table (4):** presents that mothers' total practices toward home environmental safety and prevention of poisoning for their children under 5 years old had a positive correlation with highly statistically significant relation with their total knowledge also mothers' total practices toward poisoning first aid for their children under 5 years old had also a positive correlation with a highly statistically significant relation with their total knowledge.

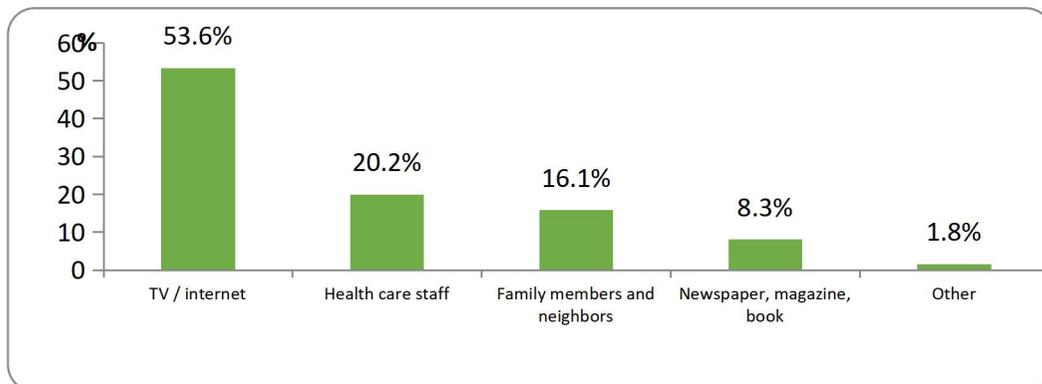
**Table (5):** indicates a statistically significant relation between mothers' age, educational level, occupation, marital status, family income monthly and their reported practices toward poisoning first aid for their children under five years old; however, there was no statistically significant relation between mothers' family type or the number of children and their reported practices toward poisoning first aid for their children under five years old.

**Table (1):** Socio-demographic characteristics of the studied mothers and their children. (n = 336).

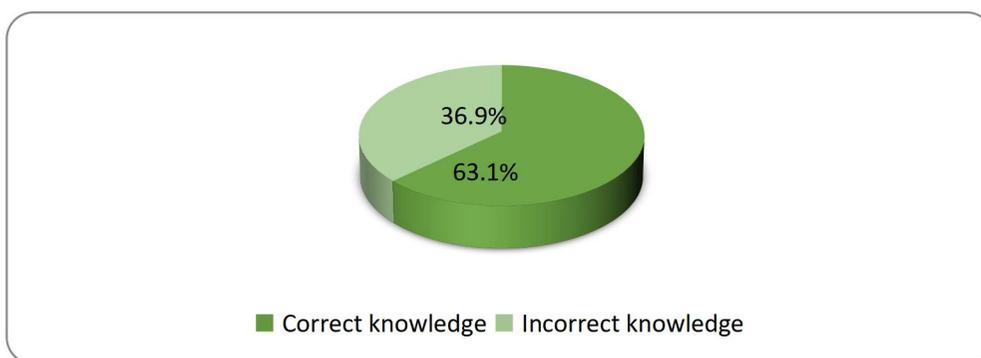
Items	N	%
<b>• Mother's age</b>		
16 < 25 years	59	17.5
25 < 33 years	135	40.2
33 < 43 years	104	31.0
43 ≤	38	11.3
<b>Mean ± SD</b>		31.57 ± 6.42
<b>-Mother's educational level</b>		
Can't read & write	28	8.4
Primary school graduate	18	5.4
preparatory school graduate	22	6.5
secondary school graduate	109	32.4
University graduate	159	47.3
<b>-Mother's occupation</b>		
Housewife	139	41.4
Employee	166	49.4
Self employed	19	5.6
Farmer	12	3.6
<b>-Mather's marital status</b>		
Married	317	94.3
Divorced	11	3.3
Widow	8	2.4
<b>-Family type</b>		
Nuclear family	130	38.7
Extended family	206	61.3
<b>-Number of children</b>		
1 child	69	20.5
2 children	113	33.6
3 children	109	32.5
4 children and more	45	13.4
<b>-Family income monthly</b>		
< 1000 LE	43	12.8
1000 < 2000 LE	77	22.9
2000 < 3000 LE	135	40.2
3000 LE ≤	81	24.1
<b>• Child's age</b>		
< 1 year	35	10.4
1 < 3 years	96	28.6
3 < 5 years	205	61.0
<b>Mean ± SD</b>		3.4 ± 1.22
<b>-Child's gender</b>		
Male	182	54.2
Female	154	45.8
<b>-Child's ranking among his siblings</b>		
1 <sup>st</sup>	96	28.6
2 <sup>nd</sup>	103	30.6
3 <sup>rd</sup>	92	27.4
The last	45	13.4

**Table (2):** Distribution of the children according to previous exposure to poisoning as reported by mothers.

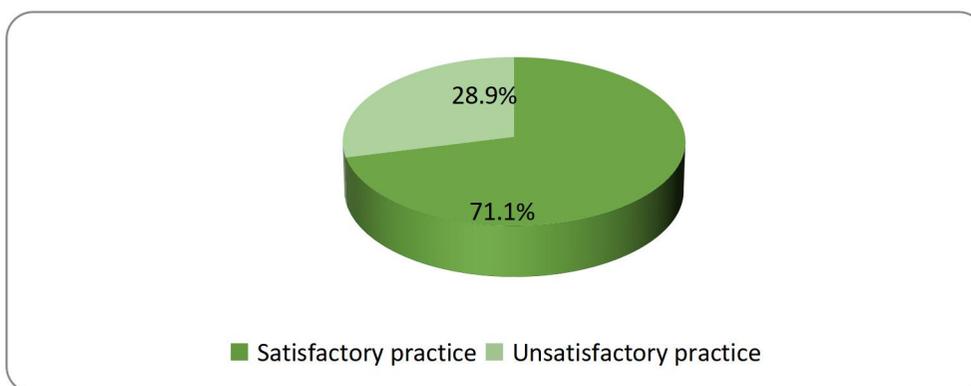
Items	N	%
<b>Previous Exposure to poisoning</b>		
Yes	66	19.6
No	270	80.4
<b>If yes, the cause of poisoning (N=66)</b>		
Medications	13	19.7
Household Products and Pesticides	20	30.3
Carbon Monoxide	3	4.6
Household Plants	1	1.5
Alcohol, Nicotine, and Illicit Substances	0	0.0
Hydrocarbons	9	13.6
Batteries	2	3.0
Personal Care Products	8	12.1
Food	10	15.2
<b>Time of poisoning</b>		
Morning	15	22.7
Noon	30	45.5
Night	21	31.8
<b>Place of poisoning</b>		
Living room	15	22.7
Kitchen	8	12.1
Bedroom	9	13.6
Bathroom	13	19.7
Balcony or garden	12	18.3
Outdoor	9	13.6
<b>First aid / Intervention performed before transferring to hospital</b>		
Yes	41	62.1
No	25	37.9
<b>The person who performed the first intervention(N=41)</b>		
Father	4	9.8
Mother	28	68.3
Brother or sister	2	4.9
Aunt or uncle	1	2.4
Grandmother or grand father	4	9.8
Another person outside home	2	4.8
<b>Going to hospital after being poisoned</b>		
Yes	54	81.8
No	12	18.2
<b>New precautions for prevention after poisoning</b>		
Yes	61	92.4
No	5	7.6
<b>The result of poisoning</b>		
Full recovery	57	86.4
Complications	7	10.6
Death	2	3.0



**Figure (1):** Percentage distribution of the studied mothers according to the source of information about poisoning.



**Figure (2):** Percentage distribution of the studied mothers according to their total knowledge about poisoning.



**Figure (3):** Percentage distribution of the studied mothers according to their total reported practices toward home environmental safety and prevention of poisoning for their children under 5 years old.

**Table (3):** Relation between sociodemographic characteristics of the studied mothers and their total knowledge about poisoning for children under 5 years old (n= 336) according to research question number 1.

Items	Total knowledge				Total	Chi-square X <sup>2</sup>	P-value
	Correct		Incorrect				
	N	%	N	%			
<b>Mother's age</b>							
16 < 25 years	32	54.2	27	45.8	59	9.545	0.023*
25 < 33 years	98	72.6	37	27.4	135		
33 < 43 years	62	59.6	42	40.4	104		
43 ≤	20	52.6	18	47.4	38		
<b>Mother's educational level</b>							
Illiterate	6	21.4	22	78.6	28	38.678	<0.001*
Primary school graduate	8	44.4	10	55.6	18		
preparatory school graduate	9	40.9	13	59.1	22		
secondary school graduate	69	63.3	40	36.7	109		
University graduate	120	75.5	39	24.5	159		
<b>Mother's occupation</b>							
Housewife	71	51.1	68	48.9	139	32.550	<0.001*
Employee	127	76.5	39	23.5	166		
Self employed	12	63.2	7	36.8	19		
Farmer	2	16.7	10	83.3	12		
<b>Mather's marital status</b>							
Married	205	64.7	112	35.3	317	5.964	0.051
Divorced	4	36.4	7	63.6	11		
Widow	3	37.5	5	62.5	8		
<b>Family type</b>							
Nuclear family	89	68.5	41	31.5	130	2.622	0.105
Extended family	123	59.7	83	40.3	206		
<b>Number of children</b>							
1 child	47	68.1	22	31.9	69	2.905	0.407
2 children	65	57.5	48	42.5	113		
3 children	69	63.3	40	36.7	109		
4 children and more	31	68.9	14	31.1	45		
<b>Family income monthly</b>							
< 1000 LE	17	39.5	26	60.5	43	15.887	<0.001*
1000 < 2000 LE	44	57.1	33	42.9	77		
2000 < 3000 LE	93	68.9	42	31.1	135		
3000 LE ≤	58	71.6	23	28.4	81		

**Table (4):** Correlation between studied mothers' total knowledge with their reported practices toward home environmental safety and prevention of poisoning and their reported practice toward poisoning first aid (n= 336) according to research question number 2.

Items	Total knowledge R	P-value
Mothers' total reported practices toward home environmental safety and prevention of poisoning for their children under 5 years	0.409	<0.001*
Mothers' total reported practices toward poisoning first aid for their children under 5 years	0.369	<0.001*

**Table (5):** Relation between sociodemographic characteristics of the studied mothers and their total practices toward poisoning first aid for their children under 5 years old (N= 336) according to research question number 3.

Items	Total practices				Total	Chi-square X <sup>2</sup>	P-value
	Satisfactory		Unsatisfactory				
	N	%	N	%			
<b>Mother's age</b>							
16 < 25 years	37	62.7	22	37.3	59	9.638	0.022*
25 < 33 years	106	78.5	29	21.5	135		
33 < 43 years	64	61.5	40	38.5	104		
43 ≤	27	71.1	11	28.9	38		
<b>Mother's educational level</b>							
Illiterate	5	17.9	23	82.1	28	110.091	<0.001*
Primary school graduate	11	61.1	7	38.9	18		
preparatory school graduate	10	45.5	12	54.5	22		
secondary school graduate	56	51.4	53	48.6	109		
University graduate	152	95.6	7	4.4	159		
<b>Mother's occupation</b>							
Housewife	82	59.0	57	41.0	139	41.980	<0.001*
Employee	137	82.5	29	17.5	166		
Self employed	14	73.7	5	26.3	19		
Farmer	1	8.3	11	91.7	12		
<b>Mather's marital status</b>							
Married	226	71.3	91	28.7	317	9.136	0.010*
Divorced	6	54.5	5	45.5	11		
Widow	2	25.0	6	75.0	8		
<b>Family type</b>							
Nuclear family	96	73.8	34	26.2	130	1.772	0.183
Extended family	138	67.0	68	33.0	206		
<b>Number of children</b>							
1 child	52	75.4	17	24.6	69	3.229	0.358
2 children	82	72.6	31	27.4	113		
3 children	70	64.2	39	35.8	109		
4 children and more	30	66.7	15	33.3	45		
<b>Family income monthly</b>							
< 1000 LE	22	51.2	21	48.8	43	11.299	0.010*
1000 < 2000 LE	54	70.1	23	29.9	77		
2000 < 3000 LE	93	68.9	42	31.1	135		
3000 LE ≤	65	80.2	16	19.8	81		

## Discussion

Poisoning is common among 1-5-years old children. Because of curiosity and willingness to learn, investigation of children's surroundings is frequently seen in this age group due to taking any substance to their mouth which may lead to poisoning. Childhood poisoning is the most common cause of admission to the hospital. Protective precautions such as mothers' education, storage of medication out of reach of children and use of safety latches are thought to be important (Bicer et al., 2014).

In the current study, the socio-demographic characteristics of the studied

mothers revealed that the mean age of the studied mothers was 31.57±6.42 and more than one-third of them had 2 children. These findings were in accordance with Lafta et al., 2013 who studied Mothers' knowledge of domestic accident prevention involving children in Baghdad City and found that the mean age of the studied mothers was 31.34 ±7.99 and less than half of them had one or two children.

Concerning mothers' educational level, employment and socioeconomic status, the current study shows that the majority of studied mothers had at least school education which indicates the improvement in educational levels of mothers in rural areas and more than half of them were unemployed and had fair socioeconomic status.

These findings were similar to **Ahmed, 2015** who studied Mothers' Knowledge Regarding Preventive Measures of Food Poisoning in Yemen and found that 61% of participants were unemployed, 95.6% of them have at least school education and 53.9% of them have fair socioeconomic status.

Regarding mothers' marital status and family type, the current study presented that the majority of the studied mothers were married and less than 4% of them were divorced also more than half of them lived in an extended family. Similar findings were reported by **Lafta et al., 2013** who found that 90.6% of the studied mothers were married, 3.6% of them were divorced and 50.8% of them lived in an extended family.

As regards to sociodemographic characteristics of the studied children (gender), the current study presents that the male/ female ratio was about 1:1 and these results were in accordance with **Halil et al., 2019** who studied Epidemiological and socio-cultural assessment of childhood poisonings at the pediatric emergency department of a tertiary level state university hospital in Turkey and found that male/ female ratio was about 1:1.

The children's common age in the current study was from 3 to 5 years old and children less than 1 year were rare. These results were convenient with **Seif et al., 2016** who did A Retrospective Study of Acute Poisoning in Children under 5 Years Old Admitted to Alexandria Poison Centre in Egypt and their finding reveals that the majority of the studied children ages were from 3 to 5 years old.

Concerning the child's ranking among his siblings, the results of the current study revealed that less than a third of them were the first son. **Abd El- Samea Mohammed et al., 2021** who studied Mothers' Perception regarding Poisoning among their Preschool Children in Toxicology Unit at Benha University Hospital agreed with these results and found that also less than a third of the studied children were the first son.

The current study reported that 19.6% of the studied children were previously exposed to poisoning due to households and pesticides followed by medication then food poisoning

accordingly also 45.5% of these cases occurred at noon which may indicate the time of mothers' work even at their home so they couldn't pay enough attention to their children also 22.7% of poisoning cases occurred at living room and 12.1% of them occurred at the kitchen.

These results were in relation to **Alazab., et al 2013** who studied Risk factors of acute poisoning among children: A study done at a poisoning unit of a university hospital in Egypt with the exclusion of children suffering from any mental disabilities and presented similar findings that 18.5% of total admissions were children and poisoning was due to cleansing agents followed by medications then food poisoning also 47.4% of cases were poisoned during the period between 8 am and 4 pm (at day time).

In contrary with the current study findings, **Farag, Said & Fakher, 2020** who studied Patterns of Pediatric Acute Poisoning at Banha Poisoning Control Center, Egypt: OneYear Prospective cross-sectional study, found that pharmaceutical drugs were the most common cause of poisoning (42.3%) followed by household cleaning products (27.8%). These dissimilarities in findings between studies might be because of differences in sample size, age, place and also the duration of the studies.

The investigator's point of view is that childhood poisoning occurred more frequently in cases in which the child was alone and his mother was busy undertaking household or other necessary activities. Also, the advancement of technology and improvement of socioeconomic status led to more chemical products such as drugs, pesticides, bleaches and cosmetics in homes. The negligence of mothers and inappropriate practices in dealing with such products and leaving them within reach of children led to an increase in poisonings among children. This information, suggests, importantly, that improved supervision may not be the most effective solution to the problem but also providing a safe environment is necessary.

The current study findings presented that less than two-thirds of the poisoning cases had first aid or interventions performed before transmission to the hospital, the majority of

them took it by their mothers and then transmitted to hospitals after being poisoned and 92.4% of poisoning cases took new precautions after being poisoned.

These findings were in accordance with **Bilgen & Ozpulat, 2016** who studied mothers' Knowledge levels related to poisoning in mothers who applied for examination and treatment at Family Health Centres in Konya, Turkey and also found that the majority of poisoning cases had first aid and interventions before transmission to the hospital and 93.1% of them took precautions after being poisoned. But also he found that the majority of poisoning cases took their first aid or interventions by their fathers and weren't transmitted to the hospital. These results were contrary to the current study may be a result of sociocultural variations between populations from these two different countries.

Concerning the results of poisoning, the present study showed that the majority of poisoning cases were fully recovered while 10.6% of them had complications and 3% died.

In the same way of the current study findings, **Kandeel & Farouny, 2017** in their Study of Acute Poisoning Cases in Children Admitted To Menoufia Poison Control Center (MPCC) During the Year (2016)" A Prospective Study" found that 95.9% of cases cured, 2% died and 2.1% had unknown results.

Knowledge is one of the main aspects that will define the extent of community awareness of public health concepts. Every mother has a different level of knowledge about childhood poisoning, its preventive measures and first aid. The availability of such information would allow community health nurses and poison management control centres to plan preventive interventions to educate the community efficiently. In the current study, the most common mothers' information sources about poisoning and its prevention were television and the internet followed by health care staff then family members and neighbours.

These results were in relation to **Megahed et al., 2016** who studied the Knowledge, attitude and practice of rural mothers towards home injuries among children under 5 years of age in Menouf District-

Menoufia Governorate, Egypt and found that the main sources of mothers' knowledge about home injuries were mass media and relatives (49.0 and 49.4%, respectively).

On the other hand, these results were contrary to **Akhila, 2013** who did a study to evaluate the effectiveness of structured teaching programs regarding household poisoning in children among mothers in selected rural area of Bangalore, India and found that the most common sources of mothers' knowledge about household poisoning were newspapers then television then health care staff respectively.

From the investigator's point of view, these differences in the source of knowledge may relate to the socio-cultural and educational variations between peoples from different countries.

With a high concern for the studied mothers' total knowledge about poisoning, this study reveals that more than a third of them had incorrect knowledge about childhood poisoning and slightly less than two-thirds of them had correct knowledge. These findings were in accordance with **Abel Galil et al., 2018** who studied Mother's Knowledge and Practices Regarding Care Of the Children with Accidental Poisoning at Zagazig University which was conducted at the poisoning control centre in Zagazig University Hospital and found that slightly less than two-thirds of the mothers in the studied sample were having total satisfactory knowledge.

The investigator's opinion is that the marked good percentage of the studied mothers' knowledge may be due to the high number of university graduated mothers among this study sample; however, the percentage of the mothers who had incorrect knowledge can't be denied and needed to be corrected and elevated through interventional educational programs as the lack of mothers' knowledge and misconception not only affects the prevention and management of the poisoning event, but it also increases the complications, disability, and fatality.

Concerning to total reported preventive practices and home safety measures of the studied mothers, this study presents that about two-thirds had total satisfactory practices and about a third of them did total unsatisfactory

practices according to the scoring system of this study.

One explanation of the current study results from the investigator's opinion is that a large number of younger mothers in this sample had completed university education. Therefore, they may have more health awareness and more motivation to join training courses or read texts about the baby and child care and implement more preventive measures. Another reason may be the majority of mothers in this study sample are working mothers with moderate socioeconomic levels and this may help them to modify and implement more preventive and safety measures to avoid poisoning in their homes.

These results were in close relation to **Abel Galil et al., 2018** who found that slightly less than two-thirds of the mothers in the studied sample were having total adequate preventive poisoning practices (63.7%).

In disagreement with the current study findings, **Nageh, Abd El-Raouf & Abd El-Mouty, 2020** who studied Mothers' knowledge and subjective practice toward most common domestic injuries among under-five children in Mansoura locality from both urban and rural areas and stated that: Mothers' score level of subjective practices related to safety measures taken at home environment to prevent poisoning was 100% improper according to their scoring system (Improper = scores less than 75% of total scores). These marked variations in the results of both studies may be due to different scoring systems, subjects and methods.

Regarding studied mothers' total reported practices toward poisoning first aids this study revealed that slightly more than two-thirds of them had total satisfactory practices and about one-third of them had unsatisfactory practices which is a worrying percentage and needs prompting interventions to raise their awareness about childhood poisoning first-aid practices.

The current study findings agreed with the study done by **Abel Galil et al., 2018** who found that only slightly more than half of the mothers had adequate total first-aid practices.

Moreover, contrary to these findings, **Farouk & Awadin, 2021** who studied the Effect of Educational Interventions Regarding Home Accidents Among Children Under Age of Six on Mothers in Rural Areas at Shaybah, Zagazig City, Sharkia Governorate found that the majority of the studied mothers had inadequate poisoning first-aid practices before implementation of the educational program.

The investigator supposed that these proportionate variations between these studies were due to study design and sampling variations.

According to the current study findings more than half of the previously exposed to poisoning, children took first aid interventions before transferring to the hospital by their mothers so the investigator emphasizes the importance of increasing the level of mothers' awareness regarding poisoning first-aid practices to avoid further harm to affected children. Applying the first-aid measures appropriately and at the right time may be lifesaving.

A study finding by **Dayasiri et al., 2017** in Sri Lanka which was the Risk Factors for Acute Unintentional Poisoning among Children Aged 1-5 Years in the Rural Community of Sri Lanka- demonstrated that approximately one-third of the parents or caregivers of children exposed to accidental poisoning had inadequate or even harmful first-aid practices.

Ideally, most mothers are more inclined to practise the right procedures to prevent poisoning among their children if they are backed by scientific or evidence-based information (**Lekei et al., 2017**).

Though health education about childhood poisoning first aid is important, the investigator believed that educational programs about it must be constructed carefully and specifically and involve actual practices to gain the required skills for the mothers who have under-five children as its impact doesn't appear immediately. **El Seifi et al., 2018** support this opinion and found in their study Effect of a community-based intervention on knowledge, attitude, and self-efficacy toward home injuries among Egyptian rural mothers having preschool children which were conducted in El Ghar

village- Zagazig district-Sharkia governorate", that a significant increase in the mean score of all studied outcomes in their post-intervention program than pre-intervention except for attitude toward immediate first aid measures. This may be because acquiring knowledge about ways of prevention is much easier than that for first aid measures; the latter one is a more complicated issue that needs repeated training and health education sessions to gain effect.

**According to research question number 1: Relation between sociodemographic characteristics of the studied mothers and their total knowledge about poisoning for children under 5 years old,** This study showed a statistically significant difference between mothers' age, educational level, occupation, monthly family income and their knowledge about poisoning.

In coordination with the current study findings, **Bakr et al., 2018** reported that there was a statistically significant difference between mothers' knowledge about poisoning and their ages; where correct knowledge was common among the young mothers' as observed in less than two-thirds of them.

In concern with mothers' occupation, there was a highly statistically significant association between mothers' occupation and their level of knowledge about poisoning for children under 5 years old as employed mothers had the highest proportion of correct total knowledge level while farmer mothers had the lowest proportion of correct total knowledge level as working mothers gain more information and socialize more with the community.

In acceptance of the investigator's opinion, **Bilgen & Ozpulat, 2016** support these results and found that there was a significant relationship between the knowledge score of the mothers on poisoning and education and their career as an increase in poisoning knowledge scores during the increase of mothers' education level was observed and mothers who were civil servants and who had a higher income level have greater knowledge scores.

Additionally, **Shirdelpour et al., 2017** found that In terms of the mother's job, a significant difference was seen in both the case

and control groups but the researchers considered that a mother's employment outside the home can have a significant impact on the level of childcare. These cases would cause negligence in the childcare and possibly put him/her at greater risk of poisoning which is another point of view.

**According to research question number 2: Correlation between Total knowledge with mothers' reported practices toward home environmental safety and prevention of poisoning and their reported practices toward poisoning first aid for their children under five years old,** this study presented that mothers' total practices toward home environmental safety and prevention of poisoning for their children under 5 years old had a positive correlation highly statistically significance with their total knowledge also mothers' total practices toward poisoning first aid for their children under 5 years old had also a positive correlation with highly statistically significance with their total knowledge.

The current study findings agreed with **Abd El – Samea Mohammed et al., 2021** who showed that there was a positive statistically significant correlation between mothers' total knowledge and total reported practices score regarding poisoning among their preschool-age children. And **Abel Galil et al., 2018** showed that there was a positive statistically significant correlation between mothers' total knowledge and total reported practices scores about poisoning first aid for children.

On the other hand, **Adhikari et al., 2017** who studied the Awareness and practice of mothers having under-five children regarding the prevention of childhood accidents which was carried out in Parsauni of Bara District, Nepal, didn't support these results and their study concluded that there was no statistically significant correlation between the awareness and practices of mothers regarding childhood accidents. These differences in results may be due to sociodemographic characteristics differences in samples, culture and custom differences between Indian and Egyptian mothers.

From the investigator's point of view, knowledge plays an important role in changing behaviour leading to a change in practices. But

not at all times knowledge is closely related to practices as knowledge influences effectively the behaviour, culture and even norms of people on the other hand there is familiarity versus awareness, as awareness means that many people have norm practices in their life that are based on familiarity without any concern about awareness.

**Gutierrez et al., 2011** support this opinion and stated that some people are unable to recognize that their normal practices could bring physical and health hazards to their household. Most mothers have bad habits when managing household chemical products and this puts their children's lives at risk. An example of a bad habit is keeping hazardous household chemical products in the wrong places or unlatched storage spaces in the house.

**According to research question number 3: Relation between sociodemographic characteristics of the studied mothers and their total practices toward poisoning first aid for their children under 5 years old this study revealed** a statistically significant difference between mothers' age, educational level, occupation, marital status, monthly family income and their reported practices toward poisoning first aid for their children under five years old.

In agreement with the current study findings, **Eldosoky, 2012** who studied Home-related injuries among children: knowledge, attitudes and practice about first aid among rural mothers which were conducted in Qalubeya governorate found that there were highly significant differences between the age of mother, level of education socioeconomic status, mothers' employment and mothers' first-aid practices about home-related injuries as the younger age of mother, higher level of education, higher socioeconomic status and being in paid employment, were significant predictors of better first-aid practices among mothers.

The current study findings revealed that mothers' total practices toward poisoning first aid for their children under 5 years old had no statistically significant difference with mothers' family type or mothers' number of children. **Farouk & Awadin, 2021** who studied the

Effect of Educational Interventions Regarding Home Accidents Among Children Under Age of Six on Mothers in Rural Areas which was conducted at Shaybah, Zagazig City, Sharkia Governorate agreed with these results and found that there was no statistically significant difference between the family crowding index of the studied mothers and their poisoning first-aid practices among their children under 6 years old.

From the investigator's point of view, the younger highly educated mothers and increased family socioeconomic level help mothers to gain more knowledge through mass and social media and enables them to apply safety measures and first aid practices at their home.

Despite the marked elevation of the rural mothers' knowledge and practices regarding poisoning prevention and first aid, their awareness about the right techniques of poisoning prevention and first aid decreased. This may be due to the absent role of the poisoning control centre in communication with rural communities and defect in primary health care centre activities to increase community awareness and the drop in the effective role of mass media in raising public awareness regarding childhood poisoning prevention and correct first aid management. Additionally, mothers' awareness regarding knowledge and practices plays a very important role in preventing childhood poisoning.

## **Conclusion**

**Based on the findings of the present study, it is concluded that:**

- Less than two-thirds of the studied mothers had correct knowledge about poisoning and slightly more than two-thirds of them had satisfactory preventive and first-aid practices toward poisoning for their children under five years old.
- There was a statistically significant relation between mothers' age, educational level, occupation, monthly family income and their knowledge of poisoning. A positive correlation with a highly statistically significant relation was found between mothers' total knowledge about poisoning

with their reported preventive and first-aid practices toward poisoning for their children under five years. A statistically significant relation between mothers' age, educational level, occupation, marital status, monthly family income and their reported practices toward poisoning first aid for their children under five years old.

### Recommendations

**In the light of the findings of this study, the following recommendations are suggested:**

- ✓ Continuous, repetitive health education programmes, training courses and supportive strategies for mothers who have under-five years old children attended primary health care settings regarding poisoning prevention, environmental safety measures and first-aid practices.
- ✓ Providing training programs regarding the prevention of poisoning and poisoning first-aid practices for high schools and university students.

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